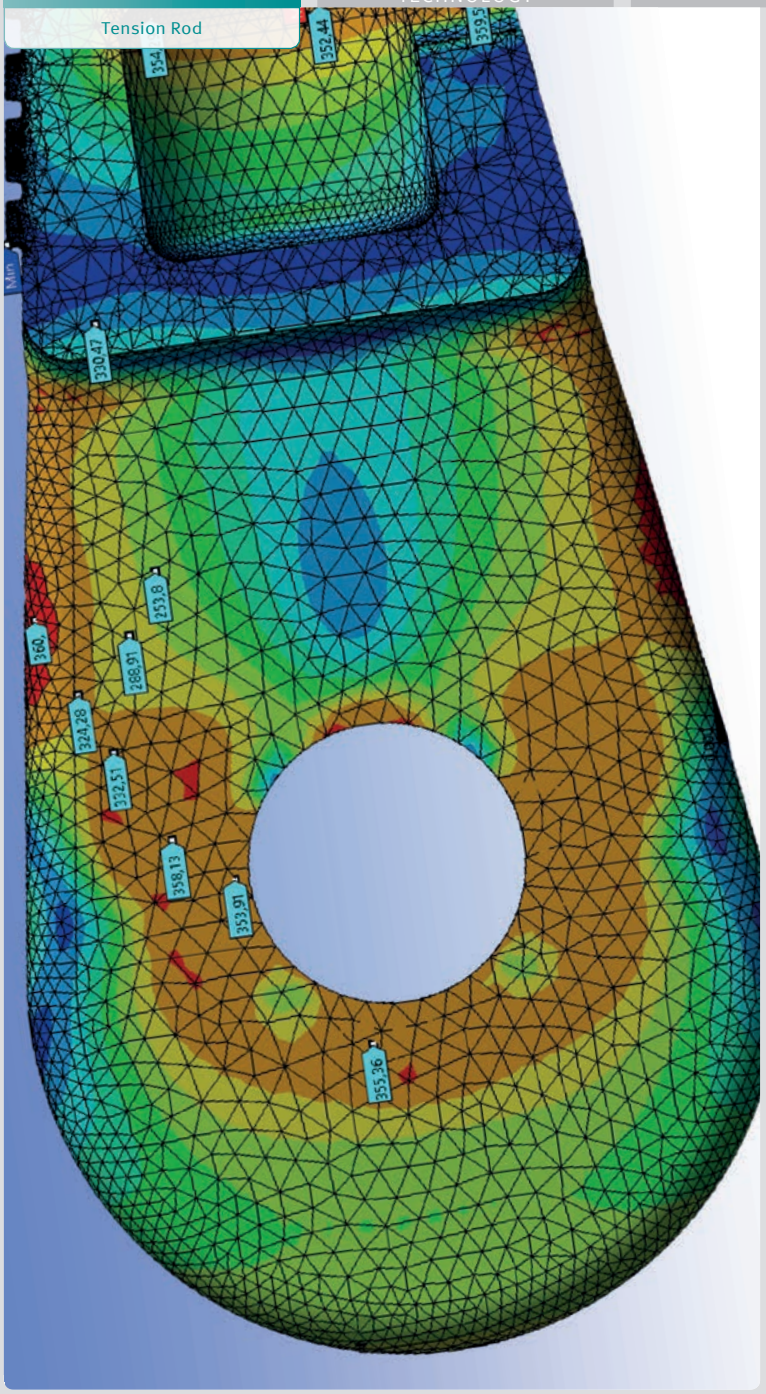


JACOB Tension Rod System HMR750

A Strong Connection That Lasts.

Technical Information

JORDAHL®
anchored in quality

A Century of Quality

The JORDAHL Company

JORDAHL connects: steel, concrete, heavy loads, and a whole lot more. Many customers around the world have already decided on high-quality products for fastening, reinforcement, shear connections, framing, and facade connection systems. Customers who choose JORDAHL want more – higher quality, broader choice, better consulting services, wider experience. They get all of this from JORDAHL. Since our company was founded in Germany in 1907, we have been at the forefront of connection and shear reinforcement system development.
JORDAHL products, such as anchor channels, have become milestones in the evolution of structural engineering and have brought lasting changes to construction, shaping the way buildings are designed and making them safer, around the world.

The JORDAHL Experts

We don't only set high standards with our products, but also offer technical consultation. Our competent and experienced JORDAHL experts are always aware of the latest developments and offer up to date, flexible, and customized solutions to cater to all your needs. The more than 700 emails and calls to JORDAHL experts every day show just how much our customers appreciate the advice. We have more than 50 engineers available around the world, who can also develop the right solution for your very specific application. Simply send an email to **info@jordahlusa.com or call (866) 332-6687.**

JORDAHL experts are pleased to help with the following:

- Advice on our products
- Information about new products
- Customized solutions for your application
- Software issues
- Development of installation methods
- Optimised solutions for economical use of our products
- Training for architects, engineers, and design engineers
- Direct on-site support

Contents

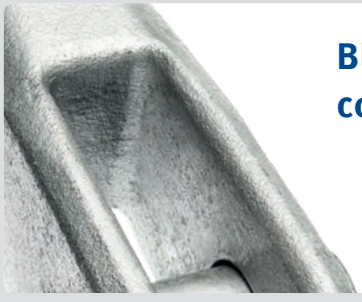
Innovation in a Tension Rod System

Data Matrix code for individual rod marking and quality assurance

Sealant injection holes prevent crevice corrosion

Special corrosion protection on threads Class C3 high corrosion compliant

Easy control of thread engagement for safer installation

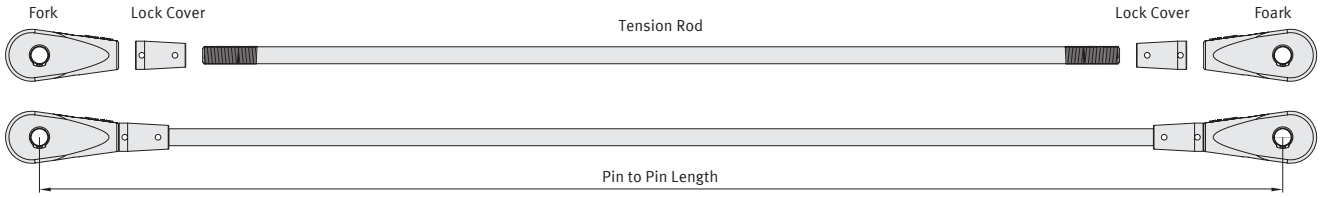


Blind Hole improves corrosion protection

Very High Load Capacities

JACOB Tension Rod System HMR750

The JACOB tension rod system HMR 750 offers modern architecture, an innovative and elegant design, improved corrosion protection, higher capacity loads and improved safety during installation.



Capacity Loads

Table 1

Thread size	mm	M12	M16	M20	M24	M30	M36	M42	M48	M56	M64	M76	M85	M90	M100
	inch	1/2"	5/8"	3/4"	1"	1-1/4"	1-3/8"	1-5/8"	2"	2-1/4"	2-1/2"	3"	3-3/8"	3-1/2"	4"
Rod diameter	mm	12"	15	19	23	28	34	40	45	54	62	74	83	88	100
	inch	0.47	0.59	0.75	0.91	1.10	1.34	1.58	1.77	2.13	2.44	2.91	3.27	3.47	3.94
Min. yield load	kN	58.80	91.87	147.41	216.01	320.13	472.03	678.46	858.67	1236.49	1629.99	2322.02	2921.18	3283.73	4240.35
	KIP	13.22	20.65	33.14	48.56	71.97	106.12	152.52	193.04	277.97	366.44	522.01	656.71	738.21	953.27
Min. break load	kN	60.67	112.80	176.25	253.80	403.62	588.04	840.68	1104.86	1607.97	2138.09	3074.64	3888.38	4381.70	5456.68
	KIP	13.64	25.36	39.62	57.06	90.74	132.20	188.99	248.38	361.49	480.66	691.21	874.14	985.05	1226.71
Rod weight	kg/m	0.89	1.39	2.23	3.26	4.83	7.13	9.87	12.49	17.98	23.70	33.76	42.47	47.75	61.65
	lb/ft	0.6	0.9	1.5	2.2	3.2	4.8	6.6	8.4	12.1	15.9	22.7	28.5	32.1	31.4
Rod length	mm	12,000													
	ft/in	39'4"													

All measurements in this table are based on the metric system. Imperial measurements are to be seen as soft conversions.
The tendon capacity table provides unfactored loads. To determine the allowable break load apply applicable safety factors to the unfactored yield and break loads shown in the above table. The break loads are derived from the thread stress area, not the nominal rod area.

JACOB tension rods are available in nominal thread sizes M12 (1/2") – M100 (4"). They are generally supplied in our high load capacity 750 grade material. In additon, our threads are cold rolled directly on to the rod offering a more economical solution to structural designs.

Rods are available up to 12 m (39‘4") length. Longer lengths can be achieved by using coupler(s) or turnbuckle(s).
All system components are designed to take the full capacity of the tension rod.

Length Adjustments

Table 2

Thread size	mm	M12	M16	M20	M24	M30	M36	M42	M48	M56	M64	M76	M85	M90	M100
	inch	1/2"	5/8"	3/4"	1"	1-1/4"	1-3/8"	1-5/8"	2"	2-1/4"	2-1/2"	3"	3-3/8"	3-1/2"	4"
System with two fork connectors	mm	±12	±16	±20	±24	±30	±36	±42	±48	±56	±61	±71	±78	±80	±85
	inch	±0.47	±0.63	±0.79	±0.95	±1.18	±1.42	±1.65	±1.89	±2.21	±2.40	±2.80	±3.07	±3.15	±3.35
Turnbuckle	mm	±20	±25	±25	±30	±30	±40	±40	±40	±50	±50	±50	±50	±60	±60
	inch	±0.79	±0.98	±0.98	±1.18	±1.18	±1.58	±1.58	±1.58	±1.97	±1.97	±1.97	±1.97	±2.36	±2.36
Cross Coupler	mm	±11	±15	±16	±19	±22	±27	±32	±35	±42	±48	±57	±62	±67	±74
	inch	±0.43	±0.59	±0.63	±0.75	±0.87	±1.06	±1.26	±1.38	±1.65	±1.89	±2.24	±2.44	±2.64	±2.91

All measurements in this table are based on the metric system. Imperial measurements are to be seen as soft conversions.

The pin to pin length is the distance between the centre-of each pin. Once installed the tendons can be adjusted by rotating the rod.

Further adjustment can be achieved by using a turnbuckle.

Corrosion Protection

JACOB tension rod systems are available in the following surface finishes:

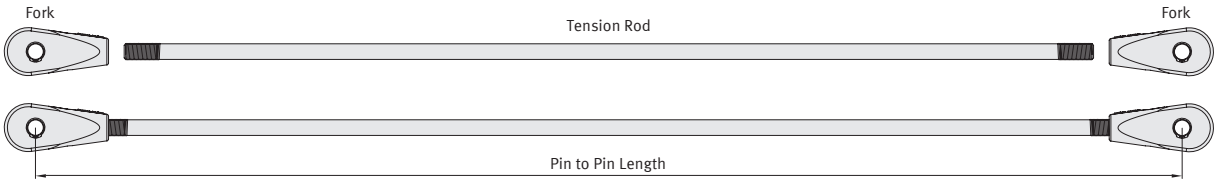
- Self color [1)]
- Hot dipped galvanized
- Powder coated
- Painted
- Duplex coated

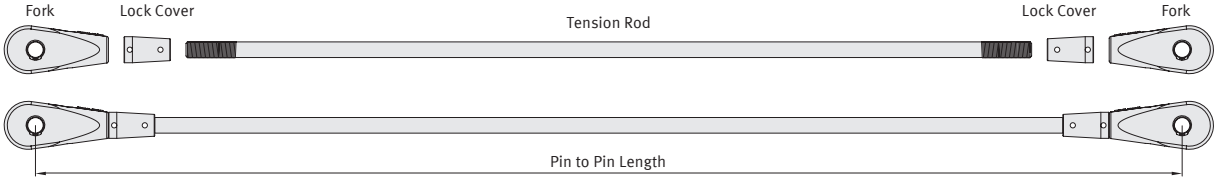
[1)] All fittings are supplied hot dipped galvanized.

System Overview

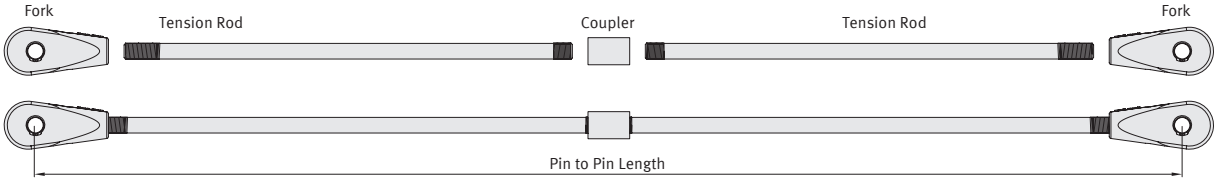
Whether it be truss systems, back-braced façades, suspensions or cross bracings, the diversity of applications of JACOB tension rods provide a high-quality solution for virtually any application.

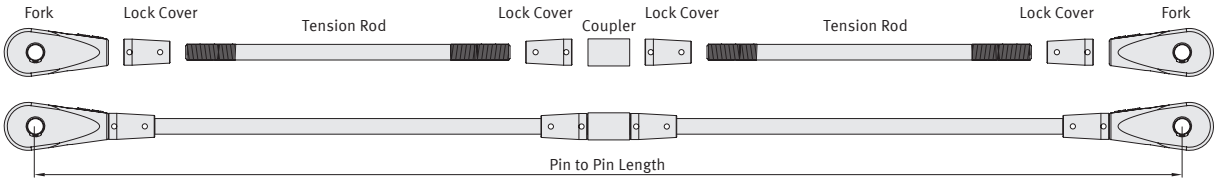
Base system

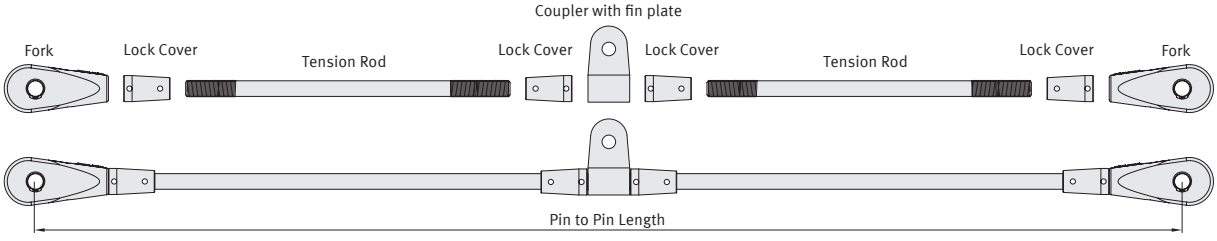




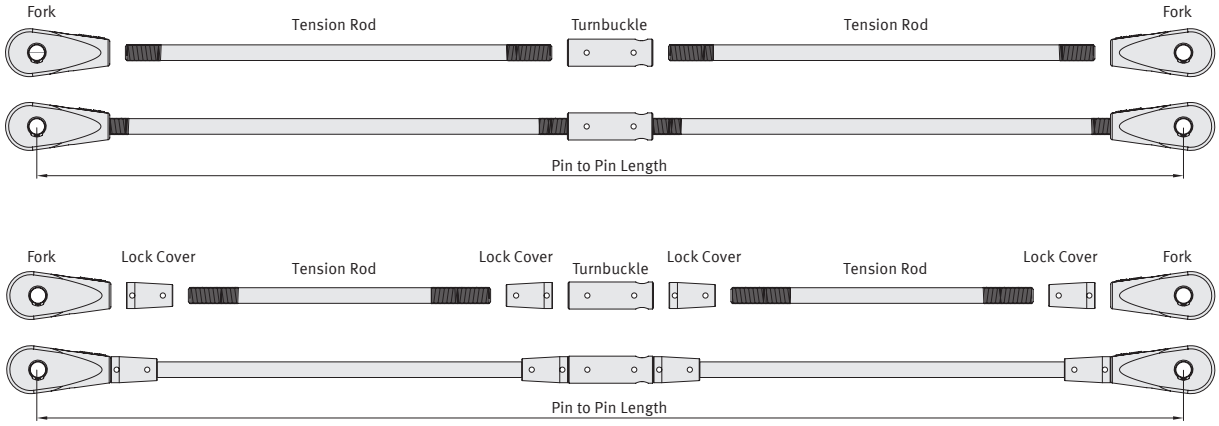
System with coupler or coupler with fin plate



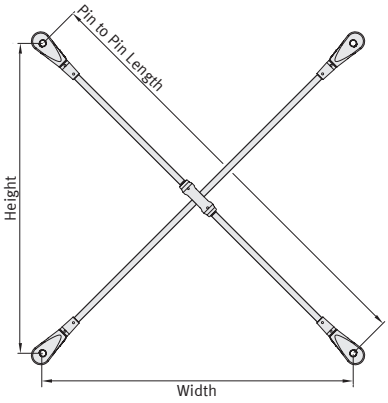




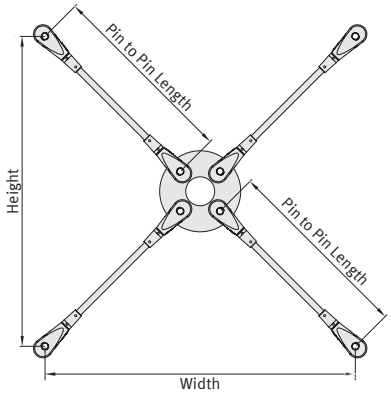
System with turnbuckle



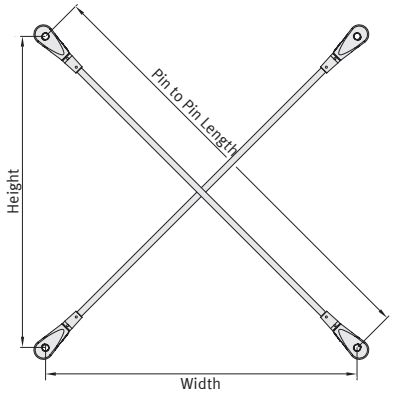
Cross Bracings



With Cross Coupler



With Connection Disc



Basic Cross Bracing

System Components

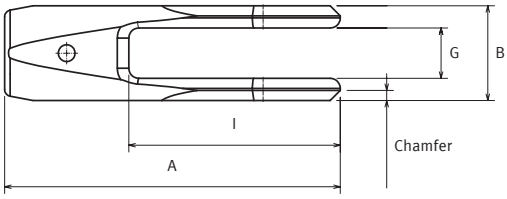
The slim and elegant design of our system components guarantees a smooth transition to the tension rod.
This allows a perfect fit into any form of architectural concept such as steel, timber and glass façade constructions.

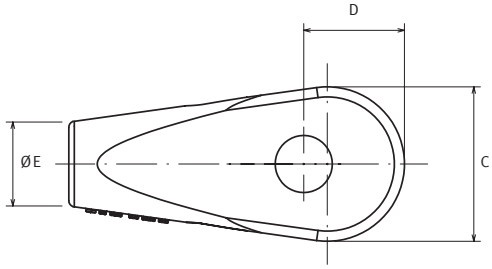
Fork

Table 3

X	mm	M 12	M 16	M 20	M 24	M 30	M 36	M 42	M 48	M 56	M 64	M 76	M 85	M 90	M 100
	inch	1/2"	5/8"	3/4"	1"	1-1/4"	1-3/8"	1-5/8"	2"	2-1/4"	2-1/2"	3"	3-3/8"	3-1/2"	4"
W	mm	12	15	19	23	28	34	40	45	54	62	74	83	88	100
	inch	0.47	0.59	0.75	0.91	1.10	1.34	1.58	1.77	2.13	2.44	2.91	3.27	3.47	3.94
Thread pitch	mm	1.75	2	2.5	3	3.5	4	4.5	5	4	4	4	4	4	4
	inch	0.07	0.08	0.10	0.12	0.14	0.16	0.18	0.20	0.16	0.16	0.16	0.16	0.16	0.16
A	mm	77	100	122	144	181	210	246	279	334	378	444	509	534	611
	inch	3.03	3.94	4.80	5.67	7.13	8.27	9.69	10.98	13.15	14.88	17.48	20.04	21.02	24.06
B	mm	22.0	28.2	36.8	44.0	50.4	65.0	76.6	89.2	99.8	119.6	150.0	155.4	174.2	179.2
	inch	0.87	1.11	1.45	1.73	1.98	2.56	3.02	3.51	3.93	4.71	5.91	6.12	6.86	7.06
C	mm	35	46	55	66	83	97	112	127	151	174	207	243	255	298
	inch	1.38	1.81	2.17	2.60	3.27	3.82	4.41	5.00	5.95	6.85	8.15	9.57	10.04	11.73
D	mm	23	30	36	44	55	64	72	83	100	115	136	153	163	188
	inch	0.91	1.18	1.42	1.73	2.17	2.52	2.84	3.27	3.94	4.53	5.35	6.02	6.42	7.40
E	mm	19	25	29	35	44	52	60	69	80	91	108	121	129	143
	inch	0.75	0.98	1.14	1.38	1.73	2.05	2.36	2.72	3.15	3.58	4.25	4.76	5.08	5.63
G	mm	12	15	18	23	25	33	38	43	48	59	74	74	84	89
	inch	0.47	0.59	0.71	0.91	0.98	1.30	1.50	1.69	1.89	2.32	2.91	2.91	3.31	3.50
I	mm	48	63	77	91	116	133	157	178	217	245	287	334	349	406
	inch	1.89	2.48	3.03	3.58	4.57	5.24	6.18	7.01	8.54	9.65	11.30	13.15	13.74	15.98
MEL Set-up point	mm	18	24	30	36	45	54	63	72	84	94.5	111.5	124	130	142.5
	inch	0.71	0.95	1.18	1.42	1.77	2.13	2.48	2.84	3.31	3.72	4.39	4.88	5.12	5.61

All measurements in this table are based on the metric system. Imperial measurements are to be seen as soft conversions.



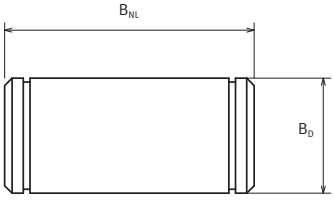


Pin with circlip (standard)

Table 4

X	mm	M 12	M 16	M 20	M 24	M 30	M 36	M 42	M 48	M 56	M 64	M 76	M 85	M 90	M 100
	inch	1/2"	5/8"	3/4"	1"	1-1/4"	1-3/8"	1-5/8"	2"	2-1/4"	2-1/2"	3"	3-3/8"	3-1/2"	4"
BD	mm	12.0	16.0	21.0	25.0	31.0	37.0	43.0	49.0	58.0	66.0	78.0	91.0	95.0	110.0
	inch	0.47	0.63	0.83	0.98	1.22	1.46	1.69	1.93	2.28	2.60	3.07	3.58	3.74	4.33
BNL	mm	31.6	38.8	49.0	57.2	67.0	82.2	96.8	112.0	122.6	145.4	175.8	183.2	203.0	211.2
	inch	1.24	1.53	1.93	2.25	2.64	3.24	3.81	4.41	4.83	5.72	6.92	7.21	7.99	8.31
X Thread (M) BD => Pin diameter BNL => Pin length															

All measurements in this table are based on the metric system. Imperial measurements are to be seen as soft conversions.

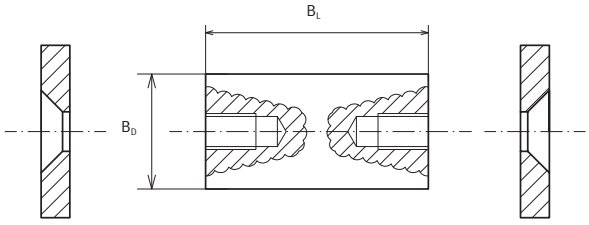


Pin with washer (on request)

Table 5

X	mm	M 12	M 16	M 20	M 24	M 30	M 36	M 42	M 48	M 56	M 64	M 76	M 85	M 90	M 100
	inch	1/2"	5/8"	3/4"	1"	1-1/4"	1-3/8"	1-5/8"	2"	2-1/4"	2-1/2"	3"	3-3/8"	3-1/2"	4"
BD	mm	12.0	16.0	21.0	25.0	31.0	37.0	43.0	49.0	58.0	66.0	78.0	91.0	95.0	110.0
	inch	0.47	0.63	0.83	0.98	1.22	1.46	1.69	1.93	2.28	2.60	3.07	3.58	3.74	4.33
BL	mm	25	31	40	47	53	68	81	93	104	126	156	161	181	186
	inch	0.98	1.22	1.58	1.85	2.09	2.68	3.19	3.66	4.10	4.96	6.14	6.34	7.13	7.32
X Thread (M) BD => Diameter pin body BL => Length															

All measurements in this table are based on the metric system. Imperial measurements are to be seen as soft conversions.

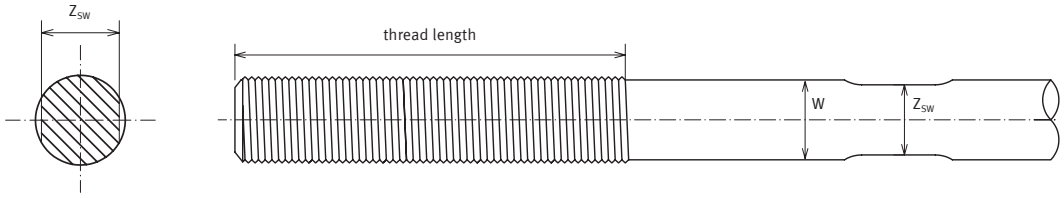


Tension rod with rolled threads (with/without spanner flat)

Table 6

X	mm	M 12	M 16	M 20	M 24	M 30	M 36	M 42	M 48	M 56	M 64	M 76	M 85	M 90	M 100
	inch	1/2"	5/8"	3/4"	1"	1-1/4"	1-3/8"	1-5/8"	2"	2-1/4"	2-1/2"	3"	3-3/8"	3-1/2"	4"
ZSW	mm	10	13	16	20	25	30	36	42	49	56	68	78	82	91
	inch	0.39	0.51	0.63	0.79	0.98	1.18	1.42	1.65	1.93	2.21	2.68	3.07	3.23	3.58
W	mm	12	15	19	23	28	34	40	45	54	62	74	83	88	100
	inch	0.47	0.59	0.75	0.91	1.10	1.34	1.58	1.77	2.13	2.44	2.91	3.27	3.47	3.94
X Thread (M) ZSW => Width across flats W => Rod Ø															

Spanner flats are available upon request. All measurements in this table are based on the metric system. Imperial measurements are to be seen as soft conversions.

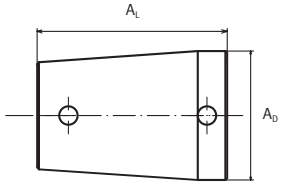


Lock cover

Table 7

X	mm	M 12	M 16	M 20	M 24	M 30	M 36	M 42	M 48	M 56	M 64	M 76	M 85	M 90	M 100
	inch	1/2"	5/8"	3/4"	1"	1-1/4"	1-3/8"	1-5/8"	2"	2-1/4"	2-1/2"	3"	3-3/8"	3-1/2"	4"
AD	mm	19	25	29	35	44	52	60	69	80	91	108	121	129	143
	inch	0.75	0.98	1.14	1.38	1.73	2.05	2.36	2.72	3.15	3.58	4.25	4.76	5.08	5.63
AL	mm	36.3	44.4	51.0	57.6	67.0	80.4	89.8	99.2	110.4	120.6	135.4	148.0	152.0	161.0
	inch	1.43	1.75	2.01	2.27	2.64	3.17	3.54	3.91	4.35	4.75	5.33	5.83	5.98	6.34
X Thread (M) AD => Diameter AL => Length															

All measurements in this table are based on the metric system. Imperial measurements are to be seen as soft conversions.

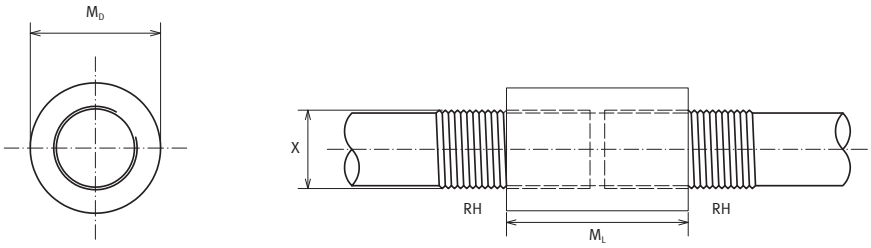


Coupler

Table 8

X	mm	M 12	M 16	M 20	M 24	M 30	M 36	M 42	M 48	M 56	M 64	M 76	M 85	M 90	M 100
	inch	1/2"	5/8"	3/4"	1"	1-1/4"	1-3/8"	1-5/8"	2"	2-1/4"	2-1/2"	3"	3-3/8"	3-1/2"	4"
MD	mm	20	26	32	38	47	56	66	75	87	99	119	135	143	160
	inch	0.79	1.02	1.26	1.50	1.85	2.21	2.60	2.95	3.43	3.90	4.69	5.32	5.63	6.30
ML	mm	32	40	48	56	68	80	92	104	120	136	160	178	188	208
	inch	1.26	1.58	1.89	2.21	2.68	3.15	3.62	4.10	4.72	5.35	6.30	7.01	7.40	8.19
X Thread (M) MD => Diameter ML => Length															

All measurements in this table are based on the metric system. Imperial measurements are to be seen as soft conversions.

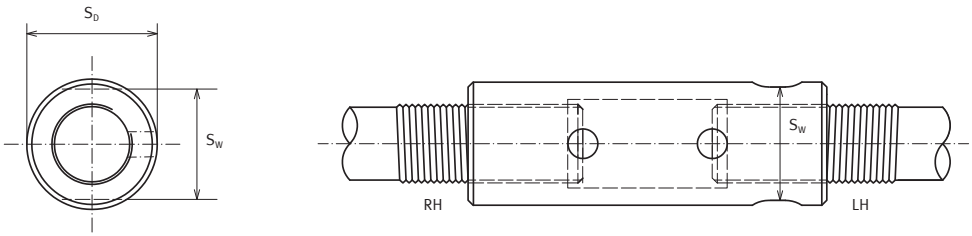


Turnbuckle

Table 9

X	mm	M 12	M 16	M 20	M 24	M 30	M 36	M 42	M 48	M 56	M 64	M 76	M 85	M 90	M 100
	inch	1/2"	5/8"	3/4"	1"	1-1/4"	1-3/8"	1-5/8"	2"	2-1/4"	2-1/2"	3"	3-3/8"	3-1/2"	4"
SD	mm	20	26	32	38	47	57	67	76	90	103	122	137	145	161
	inch	0.79	1.02	1.26	1.50	1.85	2.24	2.64	2.99	3.54	4.06	4.80	5.39	5.71	6.34
SL	mm	64	82	90	108	120	152	164	176	212	228	252	270	300	320
	inch	2.52	3.23	3.54	4.25	4.72	5.98	6.46	6.93	8.35	8.98	9.92	10.63	11.81	12.60
SW	mm	18	23	28	32	41	50	60	70	80	92	112	125	135	150
	inch	0.71	0.91	1.10	1.26	1.61	1.97	2.36	2.76	3.15	3.62	4.41	4.92	5.32	5.91
Adjustment	mm	±20	±25	±25	±30	±30	±40	±40	±40	±50	±50	±50	±50	±60	±60
	inch	±0.79	±0.98	±0.98	±1.18	±1.18	±1.58	±1.58	±1.58	± 1.97	±1.97	±1.97	±1.97	±2.36	±2.36
X Thread (M) SD => Diameter SL => Length SW => width across flats															

All measurements in this table are based on the metric system. Imperial measurements are to be seen as soft conversions.



Gusset Plates

Tension rods are attached by sliding a gusset plate, which, in turn, is fastened to the structure in between the fork end connectors. The fabrication of gusset plate connections are subject to static and structural requirements. The design should be in line with dimensions as shown in table 11.

The plate should be fabricated in Grade 50.
As part of our portfolio JACOB can offer fabricated gusset plates and unique design solutions. We also supply a broad range of products within the steel construction sector.

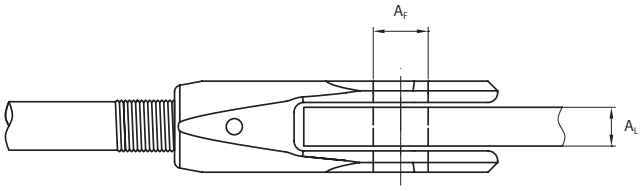
Gusset plate

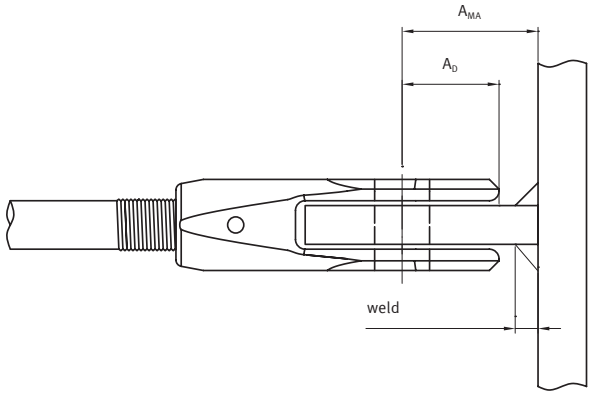
Table 10

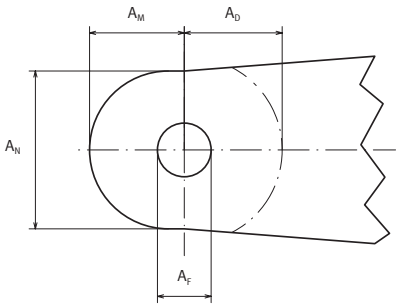
Thread size	mm	M 12	M 16	M 20	M 24	M 30	M 36	M 42	M 48	M 56	M 64	M 76	M 85	M 90	M 100
	inch	1/2"	5/8"	3/4"	1"	1-1/4"	1-3/8"	1-5/8"	2"	2-1/4"	2-1/2"	3"	3-3/8"	3-1/2"	4"
AL	mm	10	12	15	20	22	30	35	40	45	55	70	70	80	85
	inch	0.39	0.47	0.59	0.79	0.87	1.18	1.38	1.57	1.77	2.17	2.76	2.76	3.15	3.35
AF	mm	13	17	23	27	33	39	45	51	60	68	80	93	98	113
	inch	0.51	0.67	0.91	1.06	1.30	1.54	1.77	2.01	2.36	2.68	3.15	3.66	3.86	4.45
AM	mm	22	30	37	43	56	64	79	89	109	122	143	171	176	206
	inch	0.87	1.18	1.46	1.69	2.2	2.52	3.11	3.50	4.29	4.80	5.63	6.73	6.93	8.11
AN	mm	35	50	60	70	90	105	128	147	178	198	232	280	288	338
	inch	1.38	1.97	2.36	2.76	3.54	4.13	5.04	5.79	7.01	7.80	9.13	11.02	11.34	13.31
AD (mm	mm	23	30	36	44	55	64	72	83	100	115	136	153	163	188
	inch	0.91	1.18	1.42	1.73	2.17	2.52	2.84	3.27	3.94	4.53	5.35	6.02	6.42	7.40
AMA	mm	38	48	58	74	88	108	124	142	167	196	240	257	281	314
	inch	1.50	1.89	2.28	2.91	3.47	4.25	4.88	5.59	6.58	7.72	9.45	10.12	11.06	12.36

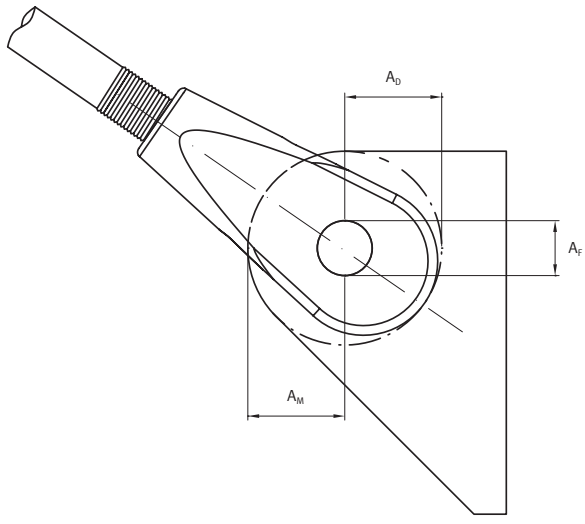
X Thread (M) AL => Thickness AF => Pin hole diameter (± 0,50 mm/0.02")
AM => Clearance (+2/-0 mm/0.087-0") AN => Minimum width
AD => refers to dimension D in table 3 (fork) AMA Recommended minimum clearance

All measurements in this table are based on the metric system. Imperial measurements are to be seen as soft conversions.









Cross Bracings

Cross bracings are a very common form of construction. Cross bracings provide stability to a structure and have the ability to resist horizontal forces. JACOB tension rod systems can be used in a variety of ways and lend themselves to a variety of structures.

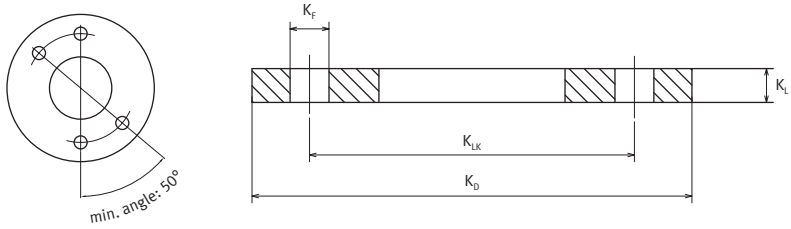
Components such as connection discs or cross couplers provide attractive connection solutions for bracing applications. JACOB cross couplers offer a more cost-effective and streamlined alternative by minimizing the number of fork connectors required.

Connection Disc

Table 11

X	mm	M 12	M 16	M 20	M 24	M 30	M 36	M 42	M 48	M 56	M 64	M 76	M 85	M 90	M 100
	inch	1/2"	5/8"	3/4"	1"	1-1/4"	1-3/8"	1-5/8"	2"	2-1/4"	2-1/2"	3"	3-3/8"	3-1/2"	4"
KL	mm	10	12	15	20	22	30	35	40	45	55	70	70	80	85
	inch	0.39	0.47	0.59	0.79	0.87	1.18	1.38	1.58	1.77	2.17	2.76	2.76	3.15	3.35
KF	mm	13	17	23	27	33	39	45	51	60	68	80	93	98	113
	inch	0.51	0.67	0.91	1.06	1.30	1.54	1.77	2.01	2.36	2.68	3.15	3.66	3.86	4.45
KD	mm	151	196	233	274	350	402	477	541	644	740	869	1029	1071	1243
	inch	5.95	7.72	9.17	10.79	13.78	15.83	18.78	21.30	25.35	29.13	34.21	40.51	42.17	48.94
Inner Ø Disk	mm	50	70	80	90	120	140	160	180	230	250	300	350	375	400
	inch	1.97	2.76	3.15	3.54	4.72	5.51	6.30	7.09	9.06	9.84	11.81	13.78	14.76	15.75
KLK	mm	107	136	159	188	238	274	319	363	426	496	583	687	719	831
	inch	4.21	5.35	6.26	7.40	9.37	10.79	12.56	14.29	16.77	19.53	22.95	27.05	28.31	32.72

X Thread (M) KL => Thickness = AL KF => Pin hole diameter (± 0,50 mm/0.02")
KD => Overall Diameter Inner Diameter KLK => Diameter of outer holes



When selecting a bracing system it should be taken into consideration that bracings using no connection should be avoided. The reason is to prevent bending moments on the fork end connectors and gusset plates and causing surface damage. If tension rods can be offset from each other this will allow the bars to be crossed.

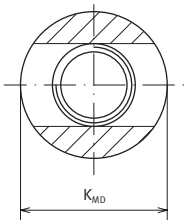
Cross coupler

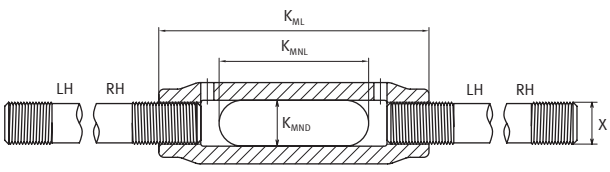
Table 12

X	mm	M 12	M 16	M 20	M 24	M 30	M 36	M 42	M 48	M 56	M 64	M 76	M 85	M 90	M 100
	inch	1/2"	5/8"	3/4"	1"	1-1/4"	1-3/8"	1-5/8"	2"	2-1/4"	2-1/2"	3"	3-3/8"	3-1/2"	4"
KMD	mm	23	31	38	46	57	69	81	92	110	125	149	168	178	198
	inch	0.91	1.22	1.50	1.81	2.24	2.72	3.19	3.,62	4.33	4.92	5.87	6.61	7.01	7.80
KML	mm	76	103	124	149	181	219	258	290	343	318	376	417	444	494
	inch	3	4.05	4.89	5.86	7.14	8.63	10.15	11.44	13.49	12.51	14.81	16.41	17.48	19.43
KMNL	mm	42	57	70	85	105	127	149	169	201	155	184	207	219	244
	inch	1.67	2.24	2.77	3.34	4,15	5	5,86	6,67	7,90	6,10	7.25	8.14	8.63	9.59
KMND	mm	13.0	17.5	21.5	26.0	32.0	38.0	44.0	50.5	59.0	67.0	79.0	89.0	94.0	105.0
	inch	0.51	0.69	0.85	1.02	1.26	1.50	1.73	1.99	2.32	2.64	3.11	3.50	3.70	4.13
Minimum angle α		45°	45°	45°	45°	45°	45°	45°	45°	45°	60°	60°	60°	60°	60°

X Thread (M) KMD => Overall Diameter KML => Length KMNL => slot length KMND => slot width

All measurements in this table are based on the metric system. Imperial measurements are to be seen as soft conversions.





Corrosion Protection

With its guaranteed 480 hours corrosion resistance in salt spray exposure, the JACOB corrosion protection package offers durability compliant to C3 high and C4 moderate environments. This applies to the full range of the JACOB tension rod system including rod threads.

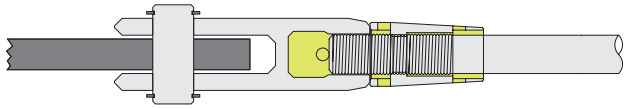
The threaded area on the rod is considered to be the weakest point on galvanized tension rods. European standard EN 19684 regulates the galvanizing process of threaded bolts and states that the threads should be centrifuged immediately after leaving the zinc bath. This is to ensure that there is a suitable layer of zinc (minimum of 50 microns).

Due to length restrictions, processes like these cannot be used on tension rods. Common methods after the galvanizing
process such as brushing and recutting the threads are used to protect the area against corrosion. There is sufficient doubt that this type of process is reliable due to the fact that both methods could impede on the galvanized coat thickness, therefore providing insufficient corrosion protection.

JACOB has introduced a new method that ensures long-term corrosion protection on the threads that represents a galvanized coating.

JACOB bar threads after 480 hours of salt spray test.

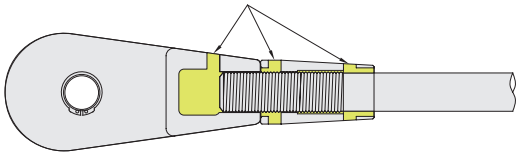
Since tension rods in exterior applications are subject to weathering and high moisture levels, complex issues associated with corrosion need to be taken into consideration. Particularly fork end connectors with tapped holes leave bar threads exposed to the continuous weathering; which can lead to unsightly corrosion. The JACOB system avoids this problem by supplying fork end connectors with blind holes and thus prevents moisture from penetrating the threaded area.



Fork with blind hole.

Another type of corrosion is crevice corrosion, which could occur if there is water retention inside an unsealed thread area. To avoid crevice corrosion, we recommend the use of the HMR sealing compound wherever necessary. The sealant should be applied via the injection holes on the various fittings (fork, lock cover, etc.).

HMR sealing compound injected into holes.



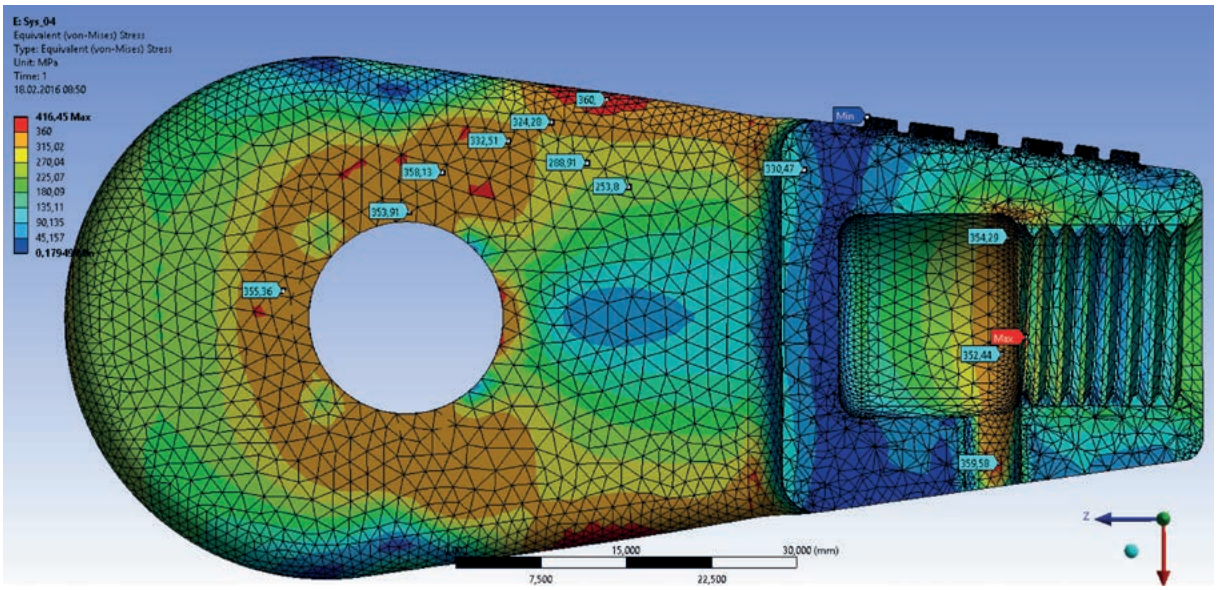
Sealed off fork end connection.

Corrosion class	Corrosivity	Durability (class)	Durability (years)*	Salt spray test in hours (h)	Examples of typical environments
C1 very low	very low less agressive interior	low	2 to 5 Years	-	Heated buildings with clean atmospheres, e.g. offices, shops, schools, hotels
		moderate	5 to 15 Years	-	
		high	more than 15 Years	-	
C2 low	low less agressive exterior/interior	low	2 to 5 Years	-	Unheated buildings where condensation may occur e.g. depots, sports halls
		moderate	5 to 15 Years	-	
		high	more than 15 Years	-	
C3 moderate	moderate moderately aggressive exterior/interior	low	2 to 5 Years	120	Production rooms with high humidity and some air pollution e.g. food-processing plants, laundries, breweries, dairies
		moderate	5 to 15 Years	240	
		high	more than 15 Years	480	
C4 high	high moderately aggressive exterior/interior	low	2 to 5 Years	240	Chemical plants, swimming pools, coastal, ship and boatyards
		moderate	5 to 15 Years	480	
		high	more than 15 Years	720	
C5-I very high (industrial)	high agressive exterior/interior	low	2 to 5 Years	480	Buildings or areas with almost permanent condensation and high pollution
		moderate	5 to 15 Years	720	
		high	more than 15 Years	1440	
C5-M very high (marine)	very high marine exterior/interior	low	2 to 5 Years	480	Buildings or areas with almost permanent condensation and high pollution
		moderate	5 to 15 Years	720	
		high	more than 15 Years	1440	

*Durability is no „warranty period"

Quality Assurance

Quality and quality assurance are the foundations of our success. Successful product development, process reliability, continuous monitoring, R&D commitment coupled with an experienced team guarantee the high quality standard of our products.



FEM model shows M16 fork during the development phase. Photo: TU Munich

The JACOB tension rod system HMR750 was developed in collaboration with TU Munich.

Tensile test on M16 fork using a break load of 150 kN.
Photo: TU Munich

Our newest thread rolling technology guarantees our quality advantage, refuting the claim that recutting of threads is the most beneficial solution.

Every tension rod is marked with a Data Matrix code, allowing easy identification at any time. The Data Matrix code ensures complete traceability of materials and production processes.

Tension rod marking with Data Matrix code.

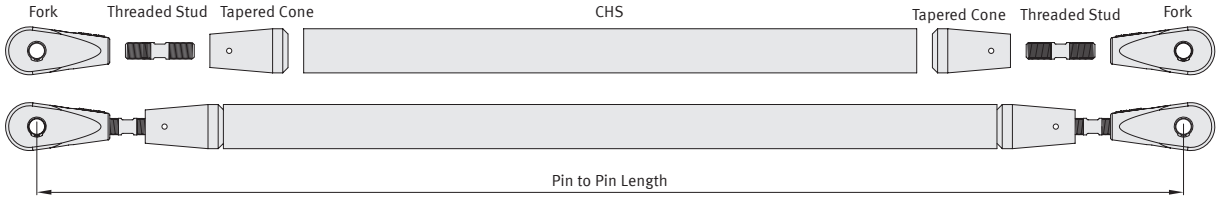
In addition to standard rod marking information, further customized data can be added such as position number, pin to pin length and unique project specifications. The data can be accessed by using our app.

JACOB Compression Strut System

In addition to our innovative product range, JACOB have introduced an architectural compression strut system which can be perfectly integrated into any structural application.

Compression struts consist of standard fork connectors plus a central hollow section with a welded tapered cone at each end.

Threaded studs are used to connect the forks with the tapered hollow section. The system is designed to enable transmission of both tensile and compressive forces.



CHS sizes and Capacities

Table 13

Fork size	mm	M 12	M 16	M 20		M24	M 30	M 36	M 42	M 48	M 56	M 64	M 76	M 85		M 90	M 100
	inch	1/2"	5/8"	3/4"		1"	1-1/4"	1-3/8"	1-5/8"	2"	2-1/4"	2-1/2"	3"	3-3/8"		3-1/2"	4"
Recommended CHS Ø	mm	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	193.7	219.1	244.5	273.0	323.9	323.9	323.9
	inch	1.33	1.67	1.90	2.37	3.00	3.50	4.50	5.50	6.63	7.63	8.63	9.63	10.75	12.75	12.75	12.75
Wall thickness	mm	4	5	5		5	5	6.3	10	10	10	12.5	16	16		16	16
	inch	0.16	0.20	0.20		0.20	0.20	0.25	0.39	0.39	0.39	0.49	0.63	0.63		0,63	0.63
Maximum-compressive force	kN	25.61	61.79	100.02		149.23	241.45	360.35	519.54	690.86	994.94	1333.95	1933.76	2427.32		2752.94	3407.59
	KIP	5.8	13.9	22.5		33.6	54.3	81.0	116.8	155.3	223.7	299.9	434.7	545.7		618.9	766.1

All measurements in this table are based on the metric system. Imperial measurements are to be seen as soft conversions.
Notes: Compressive load is calculated according to EN 1993. In all cases a structural calculation should be carried out by the structural engineer.

Length adjustments

	mm	M12	M16	M20	M24	M30	M36	M42	M48	M56	M64	M76	M85	M90	M100
	inch	1/2"	5/8"	3/4"	1"	1-1/4"	1-3/8"	1-5/8"	2"	2-1/4"	2-1/2"	3"	3-3/8"	3-1/2"	4"
System with two fork connectors	mm	±12	±16	±20	±24	±30	±36	±42	±48	±56	±64	±76	±85	±90	±100
	inch	±0.47	±0.63	±0.79	±0.94	±1.18	±1.42	±1.65	±1.89	±2.20	±2.52	±2.99	±3.35	±3.54	±3.94

All measurements in this table are based on the metric system. Imperial measurements are to be seen as soft conversions.

The pin to pin length is the distance between the centres of the pins. The exact length can be set by rotating the spanner flat on the threaded stud.

Corrosion Protection

JACOB tension rod systems are available in the following surface finishes:

- Self color [1)]
- Hot dipped galvanized
- Powder coated
- Painted
- Duplex coated

[1)] Fork, pin and threaded stud are supplied hot dipped galvanized.

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